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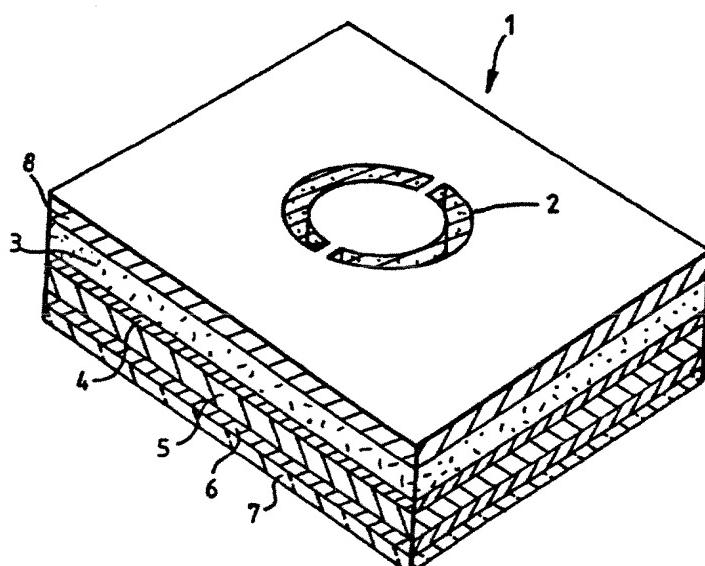
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(54) Abstract Title

Security label with UV fluorescent migratory component

(57) Objects are marked with a security code using an adhesive label which comprises a ultraviolet fluorescent migratory component 5 (eg amino coumarin) and a stencil having a coded pattern 3. The fluorescent component migrates from the layer 5 into the surface of the object to which the label is adhered so that even if the label is removed, a UV fluorescent security coded pattern can still be detected in the object. The label also includes a UV protective layer 3, an adhesive layer 6 and peelable backing layers 7,8.

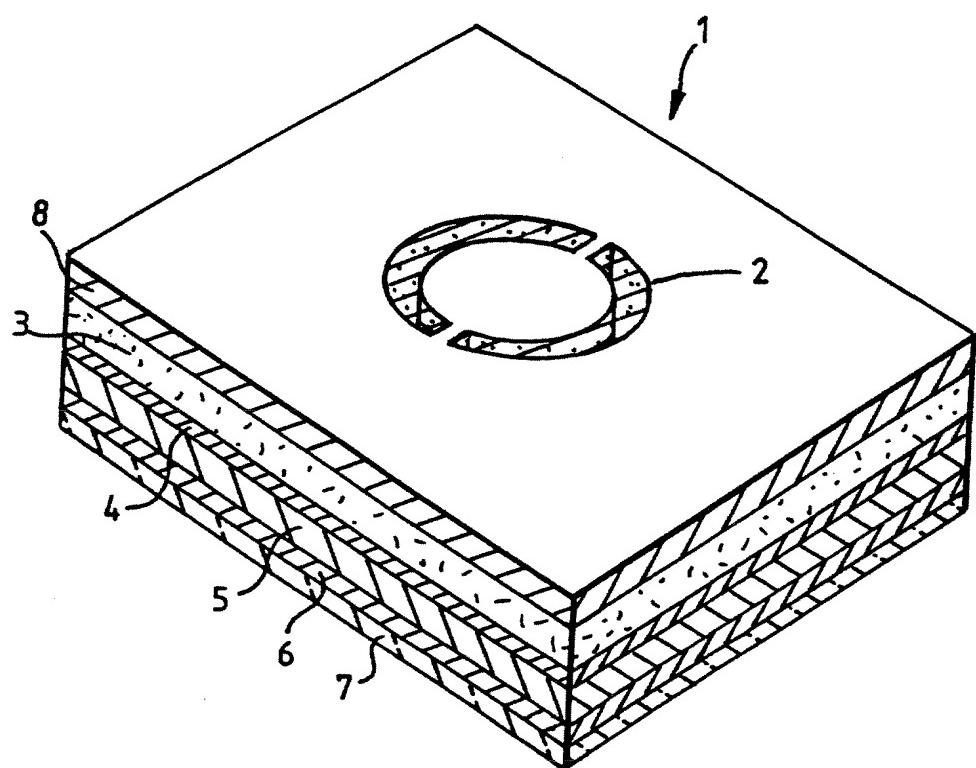


At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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Method of marking objects with a security code and
marking means for marking objects

There is presently great concern with protecting articles against theft. One of the ways in which theft can be discouraged is to make the articles stolen easy to identify and therefore difficult for thieves to dispose of safely.

This can be done by applying a security code to objects. Typically, a unique security code is applied to each object and the code can be recorded in a register. For example, the code applied to an object may be recorded on a register along with information, such as the identity of the registered owner. The code may be applied with the telephone number of the registry where the register is kept. If the object is later found, it can be verified whether the person in possession of the object is the recorded owner.

Clearly, it is desired that the codes be applied to the objects in a manner such that the code is very difficult to remove.

Code marking has been achieved in the past by a number of methods. For example, a security code can be applied to an object by simply marking the code onto the object with ink or transferable medium. For example, the code can be written on the object in visible or ultraviolet fluorescent ink. A stencil having the correct code can be placed over the object and ink or similar material applied through the holes in the stencil to mark the surface of the object.

It is found that application of marking material through stencils is relatively time consuming and introduces extra processing steps during manufacture of articles, which can be a disadvantage.

Such markings have the disadvantage that they are relatively simple to remove by removing the marking material.

Alternatively, a label bearing the code may be applied directly to the surface of the object. This has the advantage that it is relatively simple and fast to do.

Such labels have the disadvantage that they may be relatively easy to remove. A high degree of security can be provided if the strength of bond between the label and the surface of the object is such that attempts to remove the label will tend to result in the label tearing and leaving parts of the label behind. This can be achieved if the strength of the bond between the label and the surface is greater than the strength of the label material itself. This has the effect that a relatively large amount of work is required to completely remove the label. If parts of the label remain behind, a purchaser is likely to suspect that a label has been removed dishonestly.

A product entitled the "CONFIRM" label, marketed by the 3M Corporation of Minnesota, United States of America, comprises a label with an adhesive backing whereby the label may be applied to the surface of an object, typically a part of a motor vehicle. The adhesive further comprises a component for migration from the adhesive into the surface to which the label is to be adhered. The migratory material depends upon the surface to be marked. Typically, surfaces such as plastic, painted surfaces, perspex etc. are to be marked. A relatively long period of time is required before sufficient quantity of material has migrated into the surface, but this is not a problem if the labels are applied sufficiently early during a manufacturing process.

With this label, even if the label material is entirely removed, some migrated material will remain in the surface of the object to be marked. This material may be self-evident (for example, if it is dyed) or it may become evident upon treatment such as ultraviolet irradiation.

However, this simply provides an indication that a label once existed and has been removed. No information about the content of the label is provided.

The present invention sets out to provide a method of marking objects with a security code and a marking means for applying a security code to objects which is easy to use and which involve the maximum level of security against subsequent removal of the code.

The inventors have realised that pattern defining means and a medium containing a migratory component can be used to mark an object with a security code.

Accordingly, in one aspect, the present invention provides a method of applying a security code to an object, comprising applying a medium containing a migratory component to the surface of the object using means defining a pattern in the form of a security code.

The present invention further provides apparatus for applying a security code to an object, comprising a medium containing a migratory component and means defining a pattern in the form of a security code whereby the medium may be applied to the surface of the object to define a pattern in the form of a security code.

The security code may be any suitable form of coding. It may comprise a pattern or logo. Preferably, it comprises numbers and/or letters or patterns of dots defining numbers or letters. It can be used in conjunction with a system of registration as described above. Preferably, the security code is directly readable with the naked eye. It may be readable using magnifying equipment or it may be readable upon suitable treatment, such as irradiation with ultraviolet light. Other information may be included, such as the name and telephone number of a registry where a record of the code and a registered owner is kept.

The invention is suitable for marking any suitable object. The invention is particularly concerned with applying long-term security marks to components of vehicles such as cars.

The material to be marked comprises any material into which migratory component can diffuse. Typically, the materials comprise plastic or plastic-coated materials or metal or other objects coated with a coating composition such as paint, lacquer or varnish.

The medium containing migratory component may be in the form of a film. The medium may comprise the migratory component alone. Preferably, however, the migratory component is contained in a suitable carrier. The carrier may comprise a material which has another function, such as a marking or adhesive function. The carrier may comprise other components such as adhesives, a plasticizer etc.

For example, the medium may comprise liquid ink or ink in film form. When in film form, the medium may comprise a substantially free-standing film or it may comprise a relatively weak film which is supported on a backing material. For example, the medium may comprise a layer of adhesive formed on a backing material.

The term "migratory component" is used herein to define a chemical component which, when placed in contact with a selected surface, will diffuse into that selected surface. Typically, migratory components are available for diffusion into metal, painted, lacquered, varnished or plastic surfaces (including plastic-coated surfaces).

The migratory component may comprise any suitable material. The migratory component must possess the property of being able to diffuse into the surface to which it is to be applied. For example, the migratory component may comprise ink or dye of suitable known types. Preferably, the migratory component comprises a relatively low molecular weight organic compound.

The migratory component comprises an amino coumarin compound or compounds. The amino coumarin compound suitably is an ultraviolet fluorescent compound which fluoresces when exposed to radiation in the near ultraviolet region of the spectrum. Suitably, the amino coumarin fluoresces with a fluorescence spectrum including a strong emission at 465 nm.

The rate of diffusion of the migratory component into the surface of the object to be marked need not be very fast. For example, it may be of the order of a few micrograms per day.

The migratory component may be detectable in the surface to be marked by its colour, for example in the case of an ink or dye. Alternatively, it may be made visible by other means, such as irradiation with ultraviolet or suitable radiation, heating or any other suitable means.

The means defining a pattern in the form of a security code may comprise any suitable means whereby the medium containing a migratory component can be applied to the surface of the object selectively in defined regions. For example, it may comprise a stencil, in which some parts of the pattern defining means have been removed. The migratory component may be applied to the object through the spaces in the pattern defining means from a layer of the medium containing migratory component or the medium containing a migratory component may be integral with the pattern defining means and applied in the connecting areas of the stencil.

A stencil may comprise a sheet of a suitable material, typically flexible material such as paper or plastic (for example vinyl, acrylic or polyester) which has holes or spaces pierced through the material, whereby the pattern defined by the hole can be transferred to a surface on which the stencil lies. The stencil may be produced by any suitable process, for example as described in our patent application EP-A-0583067.

The migratory component may be comprised in a layer attached to the pierced sheet of the stencil. For example, a layer of migratory component may be formed on a backing material which is adhered to a stencil, whereby the migratory component can be applied to a surface through the holes in the stencil.

It is particularly preferred, however, that the sheet from which the stencil is made comprises a support sheet with a layer comprising migratory component laminated thereto, there being holes in the layer comprising migratory component at positions corresponding to holes in the support layer. Thus, a negative image of the holes can be formed on the surface to which the stencil is applied. This is in distinction to the positive image formed by known means of applying markings using stencil. In this embodiment, the stencil can be produced by piercing a stencil material comprising a sheet of support material with a layer comprising migratory component applied thereto.

The inventors have further realised that the functions of label and stencil can be combined. That is, whereas a stencil is usually used to allow marking material to be applied to the surface of an object through the holes in the stencil after which the stencil is removed, the inventors have realised that the stencil may be left in contact with the material as a label, forming an additional layer of security marking which would have to be removed by a thief to destroy the marking completely.

Accordingly, in a preferred embodiment, the present invention provides a method of applying a security code to an object, comprising applying a stencil to the surface of an object, using the stencil to apply a pattern in the form of a security code to the surface of the object, without the step of removing the stencil after the pattern is formed.

A stencil may be used which comprises a sheet of stencil material with an adhesive layer. The adhesive allows the stencil to be adhered to the surface to be marked.

The stencil may comprise at least two layers of stencil material releasably adhered together. After a pattern is applied through a stencil, the top may become messy. The top layer can be removed to leave a clean layer on the object.

Where the stencil comprises a sheet of stencil material to which a layer of adhesive has been applied, it is preferred that the adhesive is a relatively strong adhesive. That is, the strength of the bond between the adhesive and the surface to be marked should be greater than the strength of the material from which the stencil is made. Preferably, the adhesive material comprises an acrylic pressure sensitive adhesive.

The adhesive layer may comprise a mixture of adhesive and the migratory component. Alternatively, strips of migratory component and adhesive may be applied to the backing material in alternation with one another. Alternatively, the stencil may comprise a layer of stencil material such as paper or plastic to which successive layers of migratory component and adhesive have been applied, whereby migratory component and/or adhesive may diffuse through the layer of other material to the surface to allow marking/adhesion.

In a particularly preferred embodiment, there is provided a stencil comprising a sheet of stencil material, such as paper or plastic, to which there is applied a layer or layers comprising adhesive material and migratory component, the stencil being pierced in a pattern defining a security code.

The layer/layers comprising adhesive and migratory component may comprise these components mixed together, or they may comprise plurality of layers formed one upon the other.

It has been observed that ultraviolet fluorescent material is vulnerable to decomposition due to the effects of exposure and/or ultraviolet radiation. For this reason, there may be a protective layer formed on the layer containing migratory component. The protective

layer preferably excludes air/or light from the layer of migratory component to protect it. For example, LUMAR (trade mark) UV blocking film may be used.

The present invention will be further described by way of example only with reference to the accompanying drawing which shows a schematic view of a stencil according to the invention.

In the Figure, a stencil generally designated 1 is shown. A simple pattern 2 is shown pierced through the stencil.

The depths of the stencil has been exaggerated for clarity.

The stencil comprises a backing material 3 of commercially available label stock material, such as polyvinyl, acetate, ultra destruct acetate or metallic vinyl. There is a cover layer of the same or similar material adhered to the backing material by an adhesive of strength such that the top layer 8 can be lifted from the backing material without disrupting the stencil.

A thin layer 4 of an ultraviolet screening material comprising LUMAR (trade mark) UV blocking film is applied to the layer of paper 3.

Laminated to the screening material layer 4 there is a thin layer of ultraviolet fluorescing migratory component in a migratory carrier medium 5. The migratory component comprises an amino coumarin compound which has a fluorescent spectrum including a strong fluorescence at 465 nm.

Beneath the carrier medium layer 5 there is an adhesive layer 6 comprising an acrylic or similar pressure-sensitive film.

Finally, a backing-layer 7 of removable backing material such as glazed, clay coated or silicone coated paper is provided.

In use, a sheet comprising the layers 3, 4, 5, 6 and 7 is pierced in a suitable apparatus, such as that described in EP-A-0583067 to provide a stencil.

The backing-material 7 is peeled from the stencil and the stencil applied by hand or mechanically to the surface to be marked. The adhesive layer 6 forms a strong bond to the surface to be marked, whereby the entire stencil becomes securely adhered to the surface and is very difficult to remove.

The stencil 1 may remain in contact with the surface to be marked for a long period, preferably throughout the life thereof. During the period in which the stencil is adhered to the surface, migratory component from the layer 5 diffuses through the adhesive layer 6 and into the surface to be marked. As a result, after the stencil 1 has been in contact with the surface for a sufficient period of time, even if the stencil 1 is removed entirely from the surface, a mark in the form of a UV fluorescent "footprint" will remain on the surface. This footprint can be revealed by irradiating the surface with ultraviolet radiation. A pattern will be revealed comprising fluorescent parts corresponding to parts of the stencil which were solid and non-fluorescing parts corresponding to pierced parts of the stencil. Thus, the security code carried by the original stencil can be identified even when the stencil has been removed.

Optionally, an ink or other marking material layer can be applied over the stencil to further mark the surface. This may damage or discolour the top layer 8 which can be readily removed to leave the clean stencil layer 3 exposed.

CLAIMS:

1. A method of applying a security code to an object, comprising applying a medium containing a migratory component to the surface of the object using means defining a pattern in the form of a security code.
2. A method according to claim 1, wherein the object comprises plastic, plastic coated material, or objects covered with a layer of paint, lacquer or varnish.
3. A method according to claim 1 or 2, wherein the pattern defining means comprises a stencil.
4. A method according to claim 3, wherein the sheet from which the stencil is made comprises a support sheet with a layer comprising migratory component laminated thereto, there being holes in the layer comprising migratory component at positions corresponding to holes in the support layer.
5. A method according to any preceding claim, comprising the steps of applying a stencil to the surface of the object, using the stencil to apply a pattern in the form of a security code to the surface of the object and leaving the stencil on the surface of the object after the pattern is formed.
6. Apparatus for applying a security code to an object, comprising a medium comprising a migratory component and means defining a pattern in the form of a security code for applying the medium to the surface of the object to thereby define a pattern in the form of the security code.
7. Apparatus according to claim 6, wherein the migratory component comprises an ultraviolet fluorescent amino coumarin compound.
8. The apparatus according to claim 7, wherein the amino coumarin compound has a fluorescence spectrum with an emission at 465 nm.
9. Apparatus according to any of claims 6 to 8, wherein the means defining a pattern comprises a stencil.
10. Apparatus according to claim 9, wherein the sheet from which the stencil is made comprises a support sheet with a layer comprising migratory component laminated thereto, there being holes in the layer comprising migratory component at positions corresponding to holes in the support layer.

11. Apparatus according to claim 9 or 10, wherein the sheet of stencil material comprises an adhesive layer for adhering the stencil to the surface to be marked.



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Application No: GB 9812330.0
Claims searched: 1-11

Examiner: Graham Russell
Date of search: 1 December 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P):

Int Cl (Ed.6): B41M; G09F

Other: Online: EPODOC, PAJ, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2300596 A	(PORTALS) see page 7 lines 30-34 and page 9 lines 7-10	1,2,6
X	US 4455039	(COULTER) see column 1 lines 50-55, column 3 lines 55-66 and column 8 lines 21-24	1,2,6
X	US 4257692	(ESSILOR) see column 4 lines 31-33 and column 5 lines 11-39	1-3, 5,6, 9,10

- Document indicating lack of novelty or inventive step
 Document indicating lack of inventive step if combined with one or more other documents of same category.
 Member of the same patent family

- Document indicating technological background and/or state of the art.
 Document published on or after the declared priority date but before the filing date of this invention.
 Patent document published on or after, but with priority date earlier than, the filing date of this application.